No. 7700108

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Harpool Seeds Inc., McGregor Milling & Grain Company Div. of Esco Limited

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF seventeen YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. IN THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT

'Maverick'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington this 29th day of September in the year of our Lord one thousand nine hundred and seventy-eight

Attest:

Commissioner
Plant Variety Protection Office
Grain Division
Agricultural Marketing Service

Secretary of Agriculture

FORM GR-470
(1-76)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
PLANT VARIETY PROTECTION OFFICE
NATIONAL AGRICULTURAL LIBRARY
BELTSVILLE, MARYLAND 20705

FORM APPROVED
OMB NO. 40-R3712

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

INSTRUCTIONS: *See Reverse.*

1a. TEMPORARY DESIGNATION OF VARIETY	1b. VARIETY NAME	FOR OFFICIAL USE ONLY
Expt. Str. 71H447	Maverick	PV NUMBER 7700108
2. KIND NAME	3. GENUS AND SPECIES NAME	FILING DATE 9-13-77 / TIME 2:30 P.M.
Wheat, common	Triticum aestivum L.	FEE RECEIVED $250.00 / DATE 9-13-77
4. FAMILY NAME (BOTANICAL)	5. DATE OF DETERMINATION	$250.00 / 9-13-77
Gramineae	Summer 1974	$250.00 / 8-21-78

6. NAME OF APPLICANT(S)	7. ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code)	8. TELEPHONE AREA CODE AND NUMBER
Harpool Seeds Inc.	Drawer B, Denton, Texas 76201	817-387-0541
McGregor Milling & Grain Company	McGregor, Texas 76657	817-840-2851
Div. of Esco Limited	P.O. Box 6467, Corpus Christi, TX 78577	512-883-1521

9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: (Corporation, partnership, association, etc.)	10. IF INCORPORATED, GIVE STATE AND DATE OF INCORPORATION	11. DATE OF INCORPORATION
Harpool Seeds Inc.	Texas	Dec. 11, 1961
Esco Limited (Limited partnership)	Texas	Feb. 1, 1963

12. Name and mailing address of applicant representative(s), if any, to serve in this application and receive all papers:

Tom Harpool Jr.
Harpool Seeds, Inc.
Drawer B. Denton, Texas 76201

13. CHECK BOX BELOW FOR EACH ATTACHMENT SUBMITTED:

- [X] 13A. Exhibit A, Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*
- [X] 13B. Exhibit B, Novelty Statement.
- [X] 13C. Exhibit C, Objective Description of the Variety *(Request form from Plant Variety Protection Office.)*
- [X] 13D. Exhibit D, Additional Description of the Variety.

14A. Does the applicant(s) specify that seed of this variety be sold by variety name only as a class of certified seed? *(See Section 83(a). (If "Yes," answer 14B and 14C below.)* [X] YES [ ] NO

14B. Does the applicant(s) specify that this variety be limited as to number of generations? [X] YES [ ] NO

14C. If "Yes," to 14B, how many generations of production beyond breeder seed? 1 year each [X] FOUNDATION [X] REGISTERED [X] CERTIFIED

15. Does the applicant(s) agree to the publication of his/her (their) name(s) and address in the Official Journal? [X] YES [ ] NO

16. The applicant(s) declare(s) that a viable sample of basic seed of this variety will be deposited upon request before issuance of a certificate and will be replenished periodically in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

8-1-78
(DATE)

Tom Harpool Jr.
(SIGNATURE OF APPLICANT)

(DATE)

(SIGNATURE OF APPLICANT)

Rec. 2/6/75 dw

INSTRUCTIONS

GENERAL: Send an original copy of the application, exhibits and $250.00 fee to U.S. Dept. of Agriculture, Agricultural Marketing Service, Grain Division, National Agricultural Library, Beltsville, Maryland 20705. (See Section 180.175 of the regulations and rules of practice.) Retain one copy for your files. All items on the face of the form are self-explanatory unless noted below.

ITEM

5 Give the date the applicant determined that he had a new variety based on (1) the definition in Section 41(a) of the Act and (2) the date a decision was made to increase the seed.

13a Give (1), the genealogy, including public and commerical varieties, lines, or clones used, and the breeding method. (2), the details of subsequent stages of selection and multiplication. (3), the type and frequency of variants during reproduction and multiplication and state how these variants may be identified and (4), evidence of stability.

13b Give a summary statement of the variety's novelty. Clearly state how this novel variety may be distinguished from all other varieties in the same crop. If the new variety most closely resembles one or a group of related varieties; (1) identify these varieties and state all differences objectively; (2) Attach statistical data for characters expressed numerically and demonstrate that these differences are significant; and (3) submit, if helpful, seed and plant specimens or photographs of seed and plant comparisons clearly indicating novelty.

13c Fill in the Exhibit C, Objective Description form for all characteristics, for which you have adequate data.

13d Describe any additional characteristics that are not described, or whose description cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the description of characteristics that are difficult to describe; such as; plant habit, plant color, disease resistance, etc.

14A If "YES" is specified (seed of this variety be sold by variety name only as a class of certified seed) the applicant may NOT reverse his affirmative decision after the variety has either been sold and so labeled or published or the certificate has been issued. However, if the applicant specifies "NO", he may change his choice. (See Section 180.15 of the Regulations and Rules of Practice.)

MAVERICK WHEAT

Item 13 A Exhibit A Origin And History of Maverick(Revised)

Class: Hard red winter, common bread wheat, Triticum aestivum L.

Name : The name Maverick has been cleared and approved by the Committee on varietal names and the Trademark Division of the Agricultural Marketing Service. (See letter).

Developed: Bred and tested by I.M. Atkins, Small Grains Breeder and Consultant for Harpool Seeds Inc and McGregor Milling & Grain Company, a unit of Esco Ltd. The variety is owned jointly by the two firms.

Breeding and increase procedures:
Parentage: Sturdy, C.I. 13684 x Tascosa, C.I. 13023.

Grown in bulk hybrid population during segregating generations. Selected 2000 heads in 1970.

1971 Grown in progeny rows in small grain nursery. Selected 600 progenies for further testing.

1972 Grown in single rows at four locations. Identified as selection 71H447.

1973 Replicated yield trials at four locations of best 100 strains.

1974 do.

1975 do. ,strain 71H447 appeared promising in all trials, quality tests.

1976 Continued testing, included in some TAMU experimental trials. Breeder seed blocks.

1977 Continued testing. State and County Agent trials, quality tests. Increase of breeder seed blocks, rigid rogueing for purification.

1978 Will continue testing, increase seed, limited distribution for increase and demonstration.

Purification and stability of Maverick: Strain 71H447, now named Maverick has been increased from pure line seledtion in 1970 and during the past 7 years has been more uniform than the parent variety Sturdy. Variants observed are brown chaffed plants, brcwn chaffed, nodding plants, late maturing plants and some taller than the average. Variants should not exceed 0.05 percent (1 in 2000) for foundation seed nor more than 0.1 (1 in 1000) for certified fields.

MAVERICK WHEAT

Item 13 B Exhibit B

Novelty Statement (Revised)

Maverick is a new variety of semi-dwarf, hard winter wheat most similar to Sturdy, the predominant semi-dwarf variety of the area. Maverick differs from Sturdy in having all white colored glumes in contrast to the white with black stripes of Sturdy. It differs also in having slightly longer spikes, longer second internodes and more cold tolerance than Sturdy. Other differences may be observed under some conditions.

Glume, spike and leaf measurements of Maverick did not show significant differences from Sturdy. Yield and test weight were slightly superior in tests reported and grain quality for a commercial bakery flour was excellent.

Caprock, a sister of Sturdy, is similar in plant characteristics to Sturdy so Maverick differs from Caprock by those enumerated for Sturdy. TAMU-101 is slightly earlier and shorter than Maverick and TAMU 103 is several days earlier and several centimeters shorter. Maverick differs from the standard-height varieties, Centurk, Scout 66, etc. by being 10 to 15 centimeters shorter, earlier in maturity, has stronger, more storm resistant straw and superior leaf rust resistance.

FORM GR-470-6
(2-15-73)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY
WHEAT (*TRITICUM SPP.*)

INSTRUCTIONS: *See Reverse.*

NAME OF APPLICANT(S)

ADDRESS (*Street and No. or R.F.D. No., City, State, and ZIP Code*)

Harpool Seeds Inc., Denton, Texas 76201
and
McGregor Milling & Grain, Exco Limited

FOR OFFICIAL USE ONLY

PVPO NUMBER: 7700108

VARIETY NAME OR TEMPORARY DESIGNATION: Maverick

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. [0][8][9] or [0][9]) when number is either 99 or less or 9 or less.

1. KIND:

[1] 1 = COMMON 2 = DURUM 3 = EMMER 4 = SPELT 5 = POLISH 6 = POULARD 7 = CLUB

2. TYPE:

[2] 1 = SPRING 2 = WINTER 3 = OTHER (*Specify*) _____ [2] 1 = SOFT 2 = HARD 3 = OTHER (*Specify*) _____

[2] 1 = WHITE 2 = RED 3 = OTHER (*Specify*) 5/21/78 D, item 16 and Comments of breeder

3. SEASON - NUMBER OF DAYS FROM EMERGENCE TO:

[1][9][5] FIRST FLOWERING [2][0][0] LAST FLOWERING

4. MATURITY (50% Flowering):

[ ][5] NO. OF DAYS *EARLIER* THAN Centurk..... [ ] 1 = ARTHUR 2 = SCOUT 3 = CHRIS

[ ][ ] NO. OF DAYS *LATER* THAN ..... [ ] 4 = LEMHI 5 = NUGAINES 6 = LEEDS

5. PLANT HEIGHT (*From soil level to top of head*):

[ ][7][1] CM. HIGH

[ ][ ] CM. TALLER THAN ..... [ ] 1 = ARTHUR 2 = SCOUT 3 = CHRIS

[1][0] CM. SHORTER THAN Centurk. or Tascosa.. [ ] 4 = LEMHI 5 = NUGAINES 6 = LEEDS

6. PLANT COLOR AT BOOTING (*See reverse*):

[2] 1 = YELLOW GREEN 2 = GREEN 3 = BLUE GREEN

7. ANTHER COLOR:

[1] 1 = YELLOW 2 = PURPLE

8. STEM:

[1] Anthocyanin: 1 = ABSENT 2 = PRESENT

[1] Waxy bloom: 1 = ABSENT 2 = PRESENT

[1] Hairiness of last internode of rachis: 1 = ABSENT 2 = PRESENT

[1] Internodes: 1 = HOLLOW 2 = SOLID

[ ][3] NO. OF NODES (*Originating from node above ground*)

[1][6] CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW

9. AURICLES:

[1] Anthocyanin: 1 = ABSENT 2 = PRESENT

[1] Hairiness: 1 = ABSENT 2 = PRESENT

10. LEAF:

[2] Flag leaf at booting stage: 1 = ERECT 2 = RECURVED 3 = OTHER (*Specify*): _____

[1] Flag leaf: 1 = NOT TWISTED 2 = TWISTED

[1] Hairs of first leaf sheath: 1 = ABSENT 2 = PRESENT

[1] Waxy bloom of flag leaf sheath: 1 = ABSENT 2 = PRESENT

[1][0] MM. LEAF WIDTH (*First leaf below flag leaf*)

[2][1] CM. LEAF LENGTH (*First leaf below flag leaf*):

FORM GR-470-5 (REVERSE)

11. HEAD:

[1] Density: 1 = LAX 2 = DENSE

[1] Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE 4 = OTHER (Specify) _____

[4] Awnedness: 1 = AWNLESS 2 = APICALLY AWNLETED 3 = AWNLETED 4 = AWNED

[1] Color at maturity: 1 = WHITE 2 = YELLOW 3 = PINK 4 = RED 5 = BROWN 6 = BLACK 7 = OTHER (Specify): _____

[8.4] CM. LENGTH [11] MM. WIDTH

12. GLUMES AT MATURITY:

[3] Length: 1 = SHORT (CA. 7 mm.) 2 = MEDIUM (CA. 8 mm.) 3 = LONG (CA. 9 mm.)

[3] Width: 1 = NARROW (CA. 3 mm.) 2 = MEDIUM (CA. 3.5 mm.) 3 = WIDE (CA. 4 mm.)

[2] Shoulder shape: 1 = WANTING 2 = OBLIQUE 3 = ROUNDED 4 = SQUARE 5 = ELEVATED 6 = APICULATE

[3] Beak: 1 = OBTUSE 2 = ACUTE 3 = ACUMINATE

13. COLEOPTILE COLOR:

[1] 1 = WHITE 2 = RED 3 = PURPLE

14. SEEDLING ANTHOCYANIN:

[1] 1 = ABSENT 2 = PRESENT

15. JUVENILE PLANT GROWTH HABIT:

[1] 1 = PROSTRATE 2 = SEMI-ERECT 3 = ERECT

16. SEED:

[2] Shape: 1 = OVATE 2 = OVAL 3 = ELLIPTICAL

[1] Cheek: 1 = ROUNDED 2 = ANGULAR

[1] Brush: 1 = SHORT 2 = MEDIUM 3 = LONG

[1] Brush: 1 = NOT COLLARED 2 = COLLARED

[4] Phenol reaction (See instructions): 1 = IVORY 2 = FAWN 3 = LT. BROWN 4 = BROWN 5 = BLACK

[3] Color: 1 = WHITE 2 = AMBER 3 = RED 4 = PURPLE 5 = OTHER (Specify)

[6.2] MM. LENGTH [3.0] MM. WIDTH [3~~5~~1] GM. PER 1000 SEEDS 6/22/78 & aspe letter of 6/16/78

17. SEED CREASE:

[1] Width: 1 = 60% OR LESS OF KERNEL 'WINOKA' 2 = 80% OR LESS OF KERNEL 'CHRIS' 3 = NEARLY AS WIDE AS KERNEL 'LEMHI'

[1] Depth: 1 = 20% OR LESS OF KERNEL 'SCOUT' 2 = 35% OR LESS OF KERNEL 'CHRIS' 3 = 50% OR LESS OF KERNEL 'LEMHI'

18. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

[1] STEM RUST (Races) _____ [2] LEAF RUST (Races) _____ [0] STRIPE RUST (Races) _____ [0] LOOSE SMUT

[1] POWDERY MILDEW [0] BUNT [1] OTHER (Specify) Septoria

19. INSECT: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

[0] SAWFLY [1] APHID (Bydv.) [1] GREEN BUG [0] CEREAL LEAF BEETLE

[0] OTHER (Specify) _____ HESSIAN FLY RACES: [ ] GP [ ] A [ ] B [ ] C [ ] D [ ] E [ ] F [ ] G

20. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	Sturdy	Seed size	Studry
Leaf size	"	Seed shape	"
Leaf color	"	Coleoptile elongation	"
Leaf carriage	"	Seedling pigmentation	"

INSTRUCTIONS

GENERAL: The following publications may be used as a reference aid for the standardization of terms and procedures for completing this form:

(a) L.W. Briggle and L. P. Reitz, 1963, Classification of Triticum Species and Wheat Varieties Grown in the United States, Technical Bulletin 1278, United States Department of Agriculture.

(b) W.E. Walls, 1965, A Standardized Phenol Method for Testing Wheat Seeds for Varietal Purity, contribution No. 28 to the handbook of seed testing prepared by the Association of Official Seed Analysts. (See attachment.)

LEAF COLOR: Nickerson's or any recognized color fan should be used to determine the leaf color of the described variety.

MAVERICK WHEAT

Comments by Breeder:

Item 3 and 4: The number of days from seeding to flowering is not an accurate measure in winter wheat under Texas conditions. Widely adapted varieties, such as Sturdy are grown over a range of 300 miles from the High Plains of 3500 elevation to San Antonio in South Texas at elevation of less than 300 feet and growing seasons from 180 to 225 days. Plantings may be made from late Auguest to December. Varietal response to these conditions varys greatly.

Items 8 to 12: We measured from 50 to 100 samples from two or more locations to determine the means for these characters. Experience has shown that many of these are extremely variable in all varieties and influenced greatly by environment. We ran statistical analysis on all characters which showed substantial differences.

Neither the experimental strain or the named parent varieties have been purified for minor agronomic characters such as glume length, beak length, awn length etc. We do not normally do this as it would require many years to accomplish and for no practical purpose. We know that beak and awn length will vary as great as 100 percent from the basal spikelets to the top or from a main tiller to a late developed spike. We found the experimental strain no more variable than Sturdy or Tascosa.

Scout is not grown to any extent in Texas and was not included in trials. Centurk was included in some areas but no standard variety is adapted to much of this area.

Semi-dwarf varieties outcross more than standard height varieties because the ovary of the center spikelet develops and frequently sets seed. The F_1 plants and resulting hybrids continue to occur and are more evident than similar variants in standard varieties. Limitations were recently set for Sturdy and we have followed those limitations.

MAVERICK WHEAT

Item 13 D Exhibit D (Revised)

Additional Description And Information On Maverick

1. Kind: Maverick is a hard red winter wheat, Triticum aestivum L. , similar in many respects to the parent Sturdy. Sturdy was the first semi-dwarf hard red winter wheat developed and now is grown on an estimated 4 million acres in Texas and the Southwest.

2. Type: Maverick is a prostrate growing, obligate winter wheat type but has more erect seedling growth than Midwestern, cold tolerant varieties such as Scout. Maverick was observed to be more cold tolerant than the Sturdy parent, surviving 65 percent at Ames, Iowa in 1976 compared to a survival of 40 percent for Sturdy in the same test.

3. Season: The number of days from seeding to flowering may vary greatly, as pointed out in the Breeders Comments attached, because winter wheat in Texas may be seeded from August to December. An example of the range in days from seeding to flowering is given below

	Hereford Seeded Oct. 7		San Antonio Seeded Dec. 7	
	Days from emergence	Date headed	Days from emergence	Date headed
Sturdy	195	May 9	120	Mar. 28
Maverick	195	May 9	120	Mar. 28
Centurk	205	May 19	124	Apr. 1

Hereford is located on the High Plains at elevation of 3600 feet, low winter temperatures, a long frost season and cool nights whereas San Antonio is located just 90 miles from the Gulf at elevation of 300 feet, short frost season and high temperatures early in the spring season.

4. Maturity: Maverick matures on the average the same as Sturdy but often is a day later in heading. Both are 2 to 6 days earlier than Tascosa, Centurk.

5. Plant height: Eight tests over three seasons show Maverick to average the same height as Sturdy. Both are 71 centimeters in height and 6 to 10 centimeters shorter than Tascosa and Centurk.

6. 7. Plant colors: No distinctive differences in plant color were observed between Maverick and Sturdy.

Item 13 D Exhibit D (continued)

8. Stem: Maverick and Sturdy both have hollow stems. No anthocyanin pigmentation nor hairiness of the nodes was observed. (9). The auricles are small and glabrous. The second internode of Maverick is longer than that of Sturdy. The average length for Maverick was 17.27 centimeters compared to 15.47 centimeters for Sturdy. This difference of 1.80 centimeters was statistically significant (t value of 4.52 compared to .05 % level of 2.01). The internode length was measured only at Denton.

10. Leaf: The flag leaf of Maverick is recurved and glabrous. Leaves are moderate width and length and similar to Sturdy. Seedling leaves, measured only at Denton, were 0.47 cm longer than Sturdy (not statistically significant). The mature second leaf of Maverick was 0.64 cm longer than Sturdy at Denton and 0.47 cm. longer at Hereford but these differences were not significantly different.

11. Spike: The spikes of Maverick are similar to Sturdy, being moderate in size with limited taper. The Maverick spikes tend to be larger. At Denton, the spikes of Maverick averaged 8.38 cm compared to 7.65 cm. for Sturdy. The difference of 0.73 cm. was statistically significant (t value of 3.26 whereas .05 t value was 2.01). At Hereford, the difference was 0.21cm. in favor of Maverick but the difference was not statistically significant. The head width of Maverick was 0.67 mm. greater than Sturdy at Hereford but at Denton the width of Sturdy was 0.60 mm greater than Maverick. Perhaps this was a different response to irrigation. Both differences approached the 0.5 % level of significance but did not quite reach it.

The awns of Sturdy averaged 8.56 cm. at Denton and 8.59 at Hereford, compared to 8.65 and 8.58 cm. for Maverick. Differences were not statistically significant. Likewise, the beaks of the two varieties were essentially the same, Maverick averaging 6.83 mm. and 6.31 mm for the two locations while, Sturdy averaged 6.80 mm and 6.13 mm respectively.

12. Glumes: Glumes of Maverick are white or straw color. They do not develop the Blackhull stripping as does Sturdy. The outer glumes of Maverick averaged 9.12 mm long at Denton and 9.11 mm at Hereford compared to 9.02 mm and 9.04 mm

Item 13 D Exhibit D (continued)

for Sturdy, the differences being small and non-significant. Likewise, the width of the outer glumes differed by only 0.03 and 0.21 mm respectively, both small and non-significant.

13,14,15 See form

16. Seed: The seed of Maverick is ~~ovate~~ oval in shape, red in color, the brush is short and the cheeks rounded. Seed was measured in groups of 10 seeds end to end and side by side, so no statistical analysis was run. The average of several samples from three locations shows no significant difference from Sturdy in length and width. The average weight of 100 Sturdy seeds was 3.31 grams for Sturdy and 3.11 for Maverick.

Eleven tests of test weight per bushel gave an average of 58.2 for Maverick and 58.4 for Sturdy.

18. Diseases: Maverick has good tolerance to leaf rust and reactions similar to Sturdy. It is susceptible to stem rust, mildew and Septoria.

Grain Yield: Maverick has been compared with Sturdy in 14 tests from 1973 to 1977. In these it produced 33.6 bushels per acre compared to 32.7 for Sturdy. Maverick has also been included in 13 tests of the Texas Experiment and Extension trials and has averaged 42.6 compared to 43.1 for Sturdy. The standard varieties Scout, Centurk or Tascosa are not adapted over this wide area. The above differences are within limits of statistical error.

Field characteristics: Maverick is very similar to Sturdy but has been stable in eight years of observations and it is believed that it will be easier to maintain in pure stands than is Sturdy. The variety Sturdy has been very difficult to maintain in pure stands so that fields can be certified.

Variants observed in Maverick are brown chaffed plants, plants 2 to 4 inches taller and later maturing plants or late maturing tillers. The foundation class should not include more than .05 percent (1 in 2000) and the certified fields should not include more than ,1 percent (1 in 1000).

TDA-S1 D-24

TEXAS DEPARTMENT OF AGRICULTURE
SEED LABORATORY
REAGAN V. BROWN, COMMISSIONER

241 EAST McNEIL, STEPHENVILLE, TEXAS 76401

Test No. S 24787

Designated by Sender: Wheat, Sturdy Lot No. –

Received: 10/20/1977 PHENOL:

Test Requested - [redacted] $3.00 Germ. Only _____ Purity Only _____

KIND 283	PURE SEED %	INERT MATTER %	OTHER CROP SEED %	WEED SEED %	GERMINATION %	HARD SEED %	Dormant seed %	NOXIOUS WEEDS PER POUND

Date Completed 10/21/1977

Additional Information

Submitted By Harpool Seed, Inc.
Drawer B
#5490 Denton, Texas 76201

PHENOL: 99% Brown
1% Light Brown

Signed: Luther Butler
Luther Butler, Seed Analyst

TDA-S1 D-24

TEXAS DEPARTMENT OF AGRICULTURE
SEED LABORATORY
REAGAN V. BROWN, COMMISSIONER

241 EAST McNEIL, STEPHENVILLE, TEXAS 76401

Test No. S 24789

Designated by Sender: Wheat, Maverick Lot No. –

Received: 10/20/1977 PHENOL:

Test Requested ~~XXXXXX~~ $3.00 Germ. Only _____ Purity Only _____

KIND 283	PURE SEED %	INERT MATTER %	OTHER CROP SEED %	WEED SEED %	GERMINATION %	HARD SEED %	Dormant seed %	NOXIOUS WEEDS PER POUND

Date Completed Phenol Test 10-21-1977

Additional Information

Submitted By Harpool Seed, Inc.
Drawer B
#5490 Denton, Texas 76201

PHENOL TEST:
100% Brown

Signed: Luther Butler
Luther Butler, Seed Analyst

QUALITY CHARACTERISTICS OF MAVERICK WHEAT

Paired quality comparisons have been made in four seasons between Maverick and Sturdy, the first semi-dwarf hard red winter wheat, now grown on an estimated four million acres in Texas and the Southwest. Sturdy is considered by the Trade to be a high quality, strong gluten wheat suited to manufacture of commercial bakery flour or for blending with weaker wheats for the production of family flour or other uses.

Maverick was compared in four seasons and under production at several locations through the courtesy of four commercial quality laboratories. Data from wheat grown under the same conditions are compared in paired samples, as given in the attached table. Laboratories use different tests and measurements so it is impossible to determine averages in most instances. Only protein and ash were determined in all tests. In seven comparisons, Sturdy averaged 14.4 percent protein, Maverick 14.7; while, Sturdy averaged .47 percent ash and Maverick .49 percent. These differences are non-significant. Paired comparisons for many quality characteristics show no serious faults of Maverick and generally similar to Sturdy. All laboratories gave comments favorable to the new variety. Although probably not quite as strong gluten wheat as Sturdy, all Laboratories classed Maverick as a wheat which would preform well in the mill and laboratory and suitable for making commercial bakery flour. A farinograph curve of of Sturdy and Maverick from the 1977 test is attached.

Comparisons of Quality Characteristics of Sturdy And Maverick Wheat Varieties Under Texas Conditions

Item	Cargill, 1974(a)		ConAgri, 1974(b)		ConAgri, 1975(c)		ConAgri, 1975(d)		Morrison 1974 (e)		Morrison 1976(e)		Morrison 1977(e)	
	Sturdy	Maverick	Sturdy	Maverick	Sturdy	Maverick	Sturdy	Maverick	Sturdy	Maverick	Sturdy	Maverick	Sturdy	Maveric
Moisture, %	12.4	12.8	11.7	11.5	11.8	11.4	12.0	12.0	–	–	11.7	11.0	11.2	11.3
Protein, %	14.7	13.4	14.1	15.2	13.1	15.2	14.7	15.2	12.5	12.7	14.7	14.2	14.2	14.0
Ash, %	.48	.48	.48	.48	.47	.52	.51	.49	.45	.47	.50	.58	.42	.41
Extraction%	71.6	72.2	73.3	73.2	74.7	71.9	73.5	72.1	–	–	69.3	71.4	69.0	71.4
Absorption%	69.6	71.6	59.2	59.2	58.7	60.3	62.7	63.8	58.3	59.0	69.3	71.4	–	–
Flour protein	–	–	–	–	–	–	–	–	–	–	9.9	9.5	12.8	12.2
Mixing time	1-2-9	1-2-8	–	–	–	–	–	–	8	8	10.3	10.2	–	–
Mix. time index	–	–	35	45	25	40	45	35	85	95	–	–	–	–
First peak	–	–	–	–	8	6.5	8	7	–	–	12.5	12.1	18	21
Time on 500 line	–	–	–	–	–	–	–	–	–	–	20	20	–	–
Dough volume	–	–	G+	G+	–	–	–	–	2780	2640	–	–	–	–
Crumb color	G+	G+	–	–	–	–	–	–	13	12	–	–	–	–
Grain + texture	G+	G+	–	–	–	–	–	–	18	17	–	–	–	–
Rating	Strong	Strong	84	80	80	83	–	–	–	–	–	–	–	–
Total score	–	–	–	–	–	–	–	–	77	73	–	–	–	–
Test weight	–	–	60.5	61.0	60.0	59.2	–	–	–	–	–	–	58.9	60.0

(a) Composite of 4 stations
(b) grown at McGregor, Texas
(c) " " " "
(d) grown at Hereford, Texas
(e) grown at Denton, Texas

No. 194 Lot. —— Date 8-20-74

GRA - Stanby check.

Burrus Mill & Elev
Cargill Inc
57.9 P.O Box (53)
79
79370
Saginaw
Tex
76179

WHEAT -Origin :

Moisture : 1165 (1135)

Protein at 12M: 14.13 (As rec'd. 419)

MIXING CURVE - Absorption at 14M
Peak, 10 minutes - Val.
Five-minute drop
Mixing above 500 line

79
20 units
19½ minutes

~~FERMENT CURVE~~ - Bottom @ 15 minutes ——— units Peak ——— M

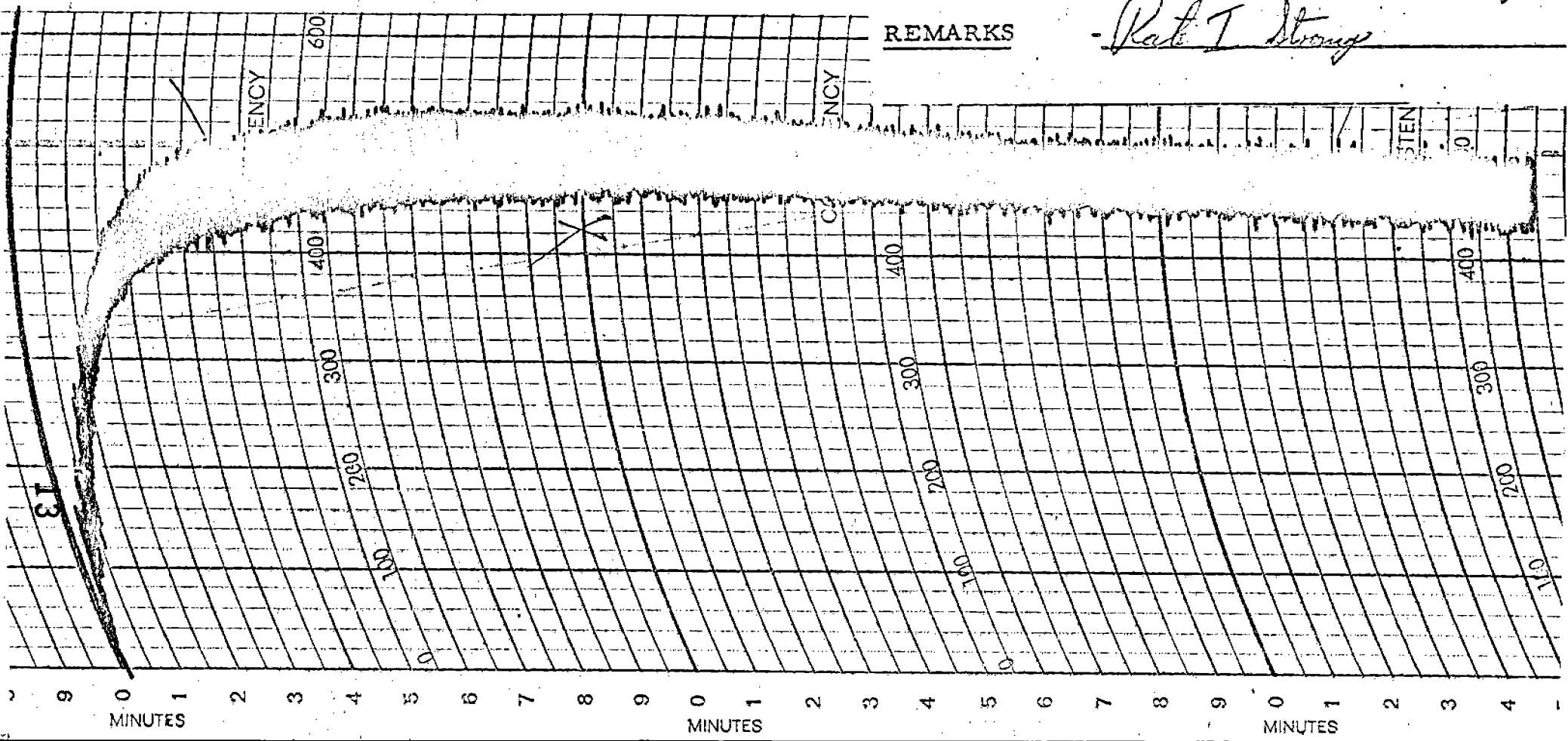
MILLING -Flour extraction 71.6
Patent per cent 71.2

BAKE

-Absorption at 14M 69.0
Mixing minutes 1-2-9
Fermentation Normal
Volume Good
Crumb color Good
Grain and texture Good

X MILL FLOUR -Moisture 13.41
Ash at 14M 480

REMARKS - Rat I Strong



No. 195 Lot. Maverick
GRA 71-H-447

Date 8-20-74

CHART 7777

(55)

WHEAT -Origin : 8846

Moisture : 11.54

Protein at 12M: 15.20 (As rec'd. 15.28)

MIXING CURVE - Absorption at 14M 60.2
Peak, 10½ minutes - Val. 82
Five-minute drop 15 units
Mixing above 500 line 22½ minutes

~~FERMENT CURVE Bottom @ 15 minutes ... units Peak ... Min.~~

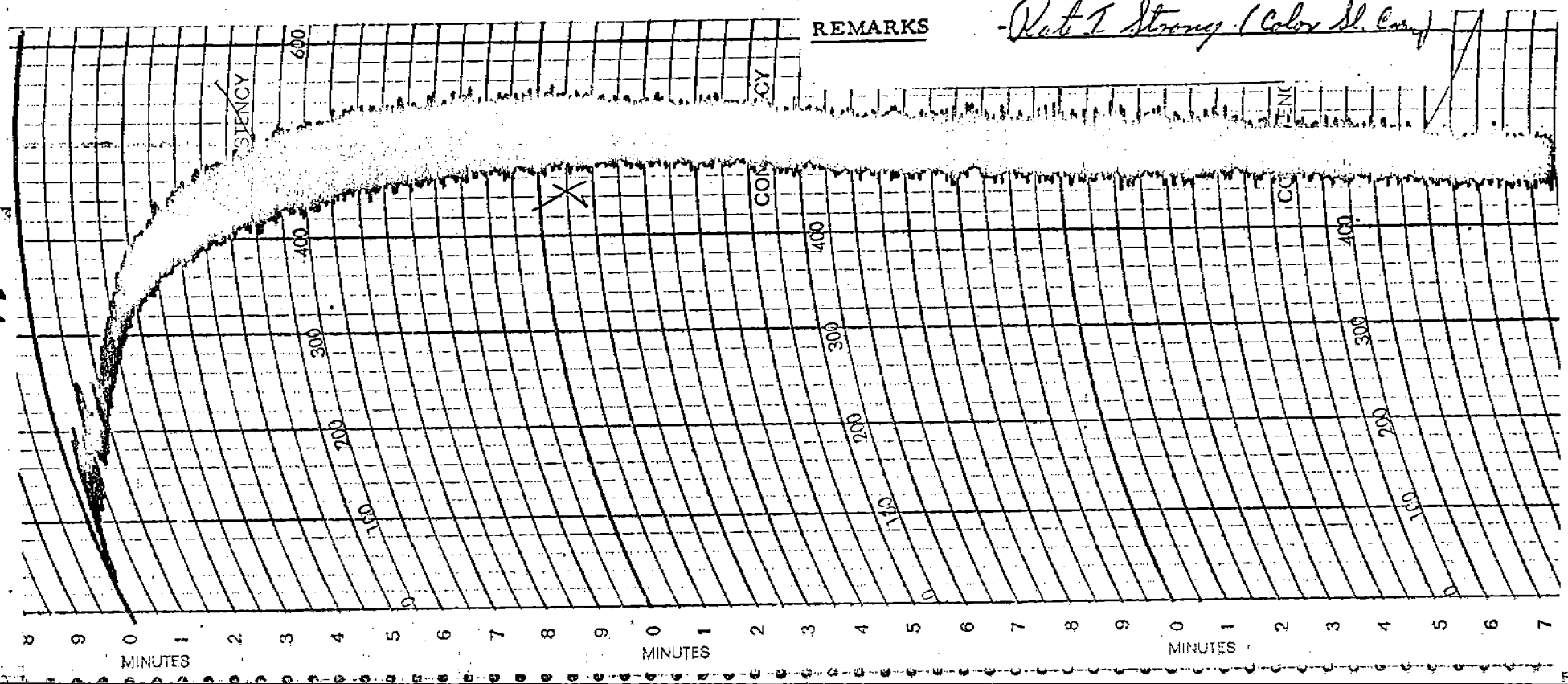
MILLING -Flour extraction 72.2
Patent per cent 90.3

X MILL FLOUR -Moisture 13.23
Ash at 14M .479

BAKE -Absorption 71.6
Mixing minutes 1-2-8
Fermentation Normal
Volume Good+
Crumb color Good Bl
Grain and texture Uniform

6.1.6
8/1-X-195

REMARKS -Rat T Strong (Color Sl. Cream)



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June 10,1978

Mr. Larry W. Dosier, Examiner
Plant Variety Protection Office

Dear Mr. Dosier:

We regret the errors made in preparing the application for Maverick wheat, No. 7700108. We have made the necessary corrections on Exhibits C and D, where they were simple changes. The others I shall discuss.

Regarding the comparisons with Kirwin wheat. We do not grow this variety as it is not adapted and I have seen it only a few times. However, it is my understanding that it is a standard height variety, whereas Maverick is semi-dwarf. Limited data which we have show in 1973 that Kirwin grew to be 46 inches tall, the same as Centurk while Sturdy, Caprock and T.101 were 37 inches tall. In 1975, Kirwin was 34 inches tall and Sturdy was 31 inches (Sturdy similar to Maverick).

Kirwin could well overlap the heading dates of Maverick, as do also Caprock and T. 101, although I believe it usually is later maturing. Our data in Exhibit D shows Maverick to be 4 to 10 days earlier than Centurk and about the same as Sturdy. On the other hand, Dr. Porter at Bushland recorded first head for Sturdy in 1973 as May 19, Kirwin May 17, Centurk May 20 and Triumph May 18. Normally Triumph is our earliest maturing variety. In our earlier application on the variety TexRed, No. 7700109, we showed that it was usually only one or two days different from Sturdy at Hereford but at the lower elevation and higher winter temperatures of San Antonio, it headed 6 to 10 days earlier than Sturdy. Several years ago I went back through our records at TAES from 1930 to 1965 and recorded the date of first head for each of the cereals. The Early Blackhull variety ranged in heading from April 8 to May 3 over those 35 years. So, location and many other factors affect maturity and relationships vary each year.

The weight of seed of Maverick should be either 31 grams per 1000 seed or 3.1 grams per 100 seed.

As the seedling growth habit is rated only as P (winter), I (intermediate) or S (spring), we had to classify Maverick as prostrate. However, there are variations in each class. In our note taking, we record D-,D(decumbant),D-/ , I-, I (inter mediate), I-/, U-,U(upright), U-/, giving us nine classes. Maverick is more erect than such very cold tolerant varieties as Kharkof or even Centurk, hence our statement.

The shape of the Maverick seed should have been oval.

I hope this will put the application in correct conditon,

Very truly yours
I.M. Atkins
I.M. Atkins
Plant Breeder

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